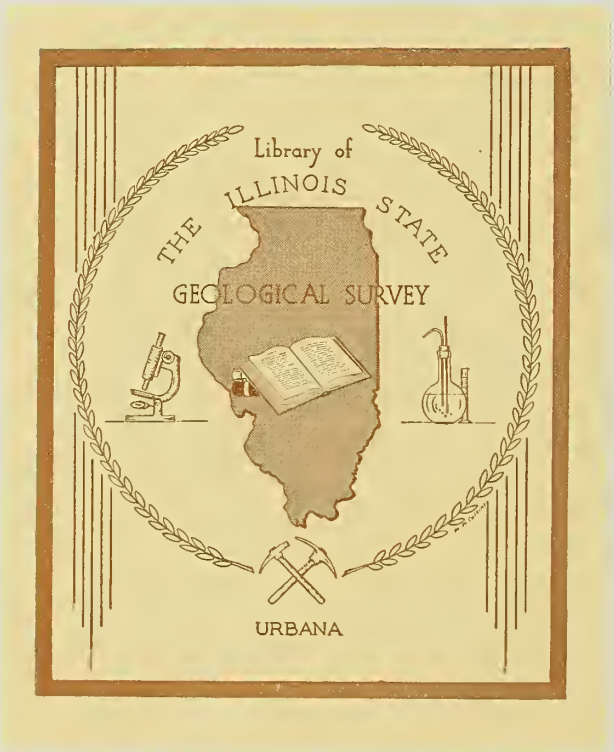

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ENVIRONMENTAL GEOLOGY NOTES

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PRELIMINARY GEOLOGICAL EVALUATION OF DAM AND RESERVOIR SITES IN MC HENRY COUNTY, ILLINOIS

W. Calhoun Smith

ILLINOIS STATE GEOLOGICAL SURVEY

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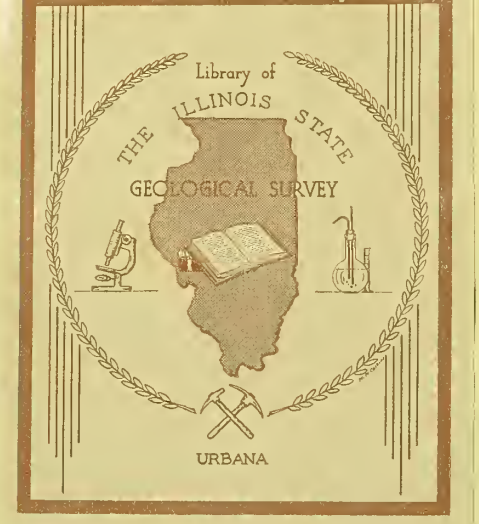
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PRELIMINARY GEOLOGIC EVALUATION OF DAM AND RESERVOIR SITES IN MC HENRY COUNTY, ILLINOIS

W. Calhoun Smith

INTRODUCTION

A preliminary geologic evaluation of 46 proposed dam and reservoir sites in McHenry County was undertaken at the request of the McHenry County Regional Planning Commission. The Commission chose the locations of the sites to be evaluated. Other potential reservoir sites in McHenry County are not considered in this report.

The surficial geology of McHenry County is complex. Six glacial till units have been described—the Winnebago (oldest), Marengo, Gilberts, Huntley, Marseilles, and West Chicago (youngest). Units of outwash sand and gravel also are present. The West Chicago drift is principally sand and gravel and appears to have drowned a hilly topography that existed on the older deposits. In general, it is thicker in the eastern part of the county than in the western. Almost the entire surface of McHenry County is mantled with a thin deposit of loess, which is generally thicker in the western part of the county than in the eastern. The loess masks the underlying materials at many places.

The geologic descriptions of the sites are based on a geologic map and unit descriptions prepared by David L. Gross (in "Geology for Planning in McHenry County," by J. E. Hackett and M. R. McComas, Ill. Geol. Survey Circ., in preparation) and upon my previous work in McHenry County. Field examinations of the geology in the vicinity of each site were made so that local variations significant to dam and reservoir development could be incorporated in the descriptions and considered in the evaluations.

Only the geologic feasibility of the sites has been evaluated. Before any site is considered for development, a hydrologic study should be made to determine that sufficient water is available to maintain a reservoir.

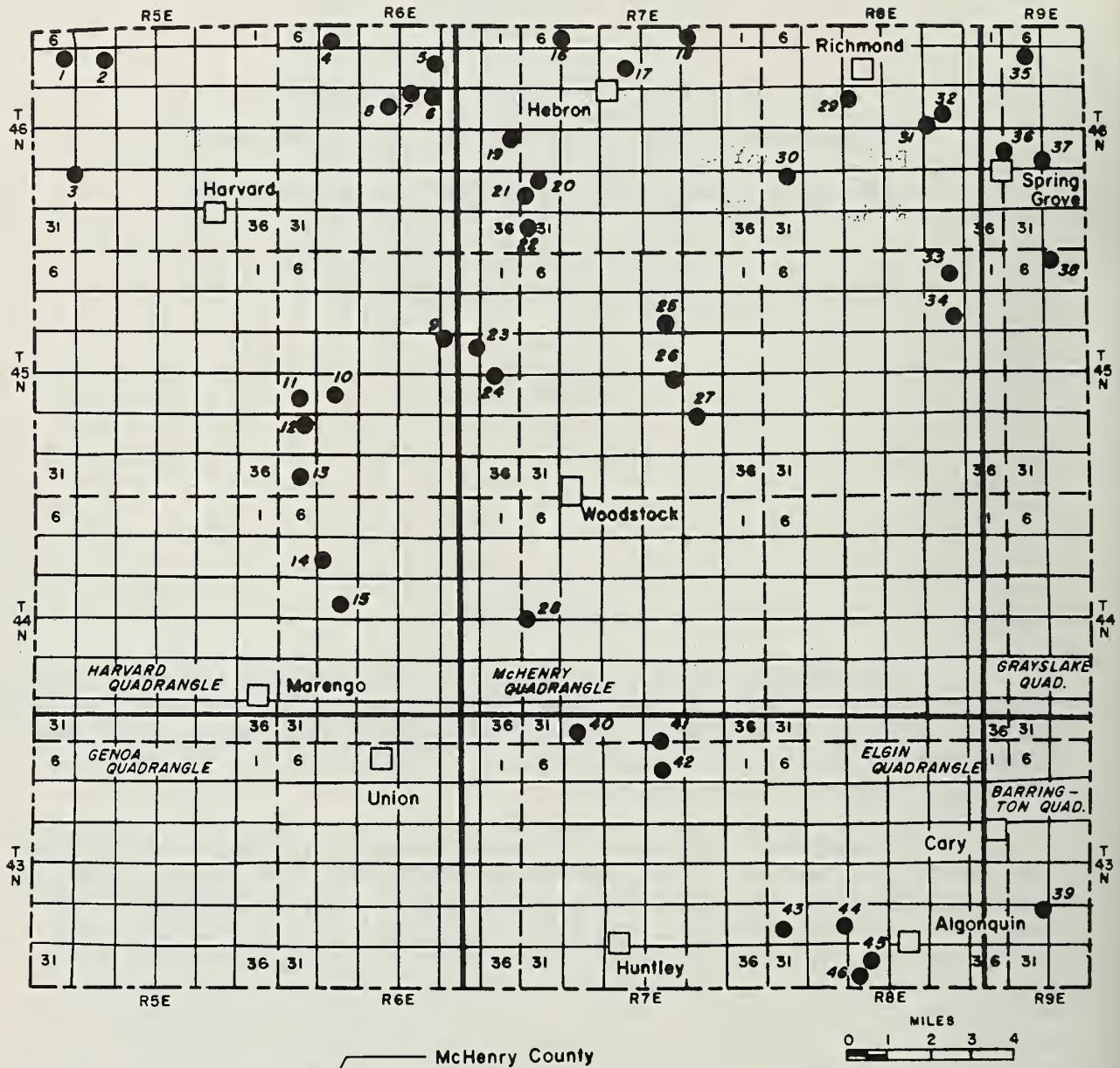

Fig. 1. Locations of proposed damsites in McHenry County, subdivision by township, range, and section, and relative positions of the 15-minute quadrangles covering the county. Index map shows location of McHenry County.

Although not mentioned in the site descriptions, it should be thoroughly understood that an adequate program of investigation, including test boring and materials study, must be undertaken to determine the specific geologic and foundation conditions at any site considered for dam and reservoir construction.

At all of the sites considered, it was assumed a reservoir was to be developed by constructing a dam and allowing the water to rise above present stream level, with the expectation that a constant water level would be maintained. The evaluations are based upon the probable nature of the underlying materials and the probable water-holding ability of the proposed reservoir basin. Neither the possibility of using special construction techniques to develop a deficient site, such as lining a leaky reservoir with clay, nor the possibility of developing a reservoir at ground-water level by excavation were considered in judging site feasibility.

The possibility of excessive leakage into permeable materials rather than weakness or instability of foundation materials is the most common drawback to the construction of dam and reservoir sites in McHenry County. However, if a reservoir is needed badly enough at a given location and if budget is no problem, many deficient sites can be utilized by applying special construction techniques.

The locations of proposed sites are given by section, township, and range, and the descriptions are grouped according to the 15-minute quadrangle in which the sites are located.

Harvard Quadrangle	Sites 1 to 15
McHenry Quadrangle	Sites 16 to 34
Grayslake Quadrangle	Sites 35 to 38
Barrington Quadrangle	Site 39
Elgin Quadrangle	Sites 40 to 46

The positions of the quadrangles covering the county are shown in figure 1. To facilitate finding the site locations on 15-minute quadrangle topographic maps, the outlines of the proposed reservoirs are shown in figures 2 to 5 on maps drawn at the same scale as the topographic maps. Each site description is written as a separate entity so that significant facts are together for the convenience of the user.

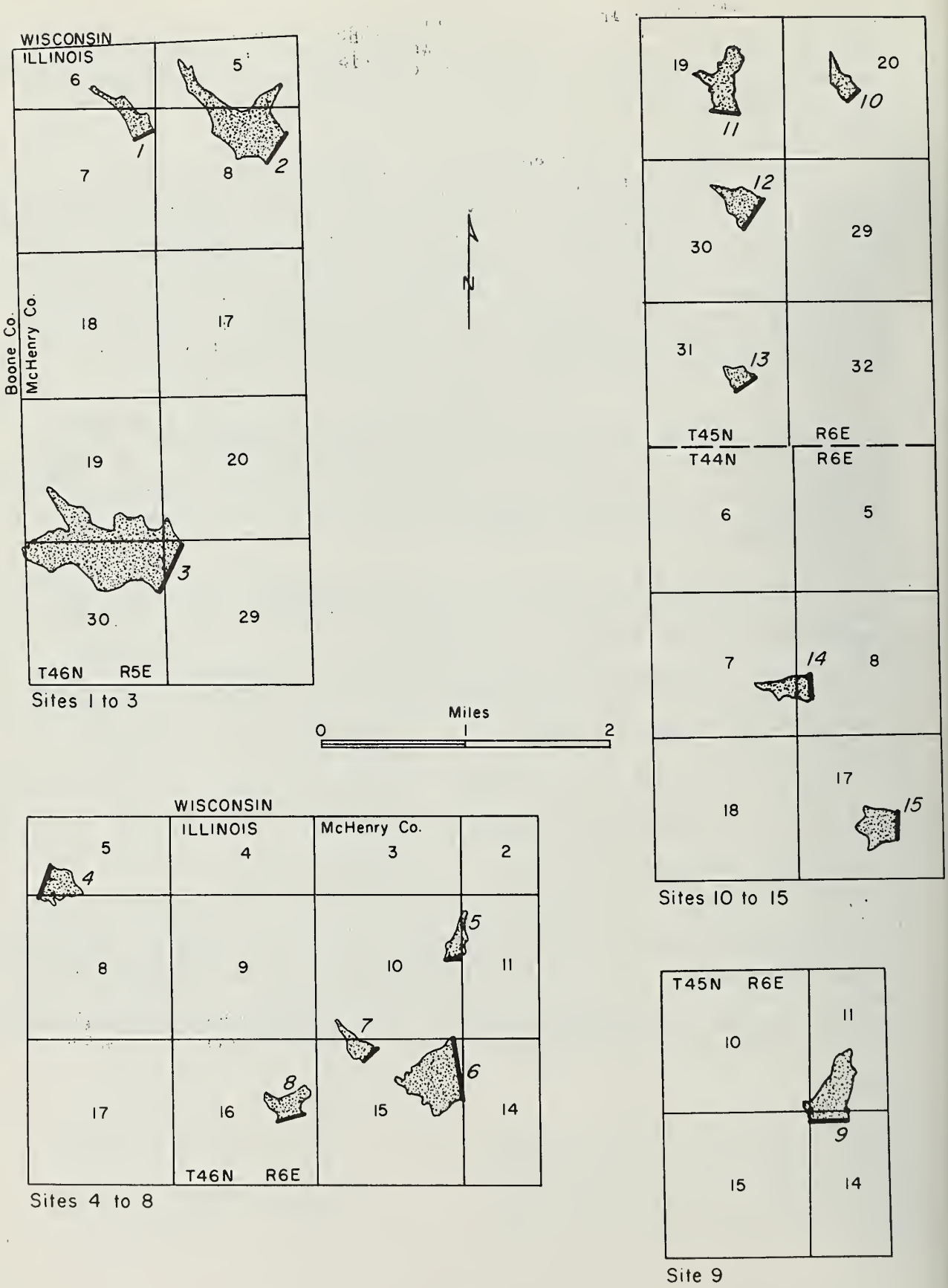

Fig. 2. Proposed dam and reservoir sites 1 to 15 in the McHenry County part of the Harvard Quadrangle.

DESCRIPTION AND EVALUATION OF MC HENRY COUNTY SITES

HARVARD QUADRANGLE

Site 1

Proposed site 1 is located largely in the NE¼ sec. 7, T. 46 N., R. 5 E., on the upper reaches of West Branch Piscasaw Creek.

In the vicinity of the site, West Branch drains an area underlain by Winnebago till, a silty, sandy, clayey till that is compact and relatively impervious. Topographic relief in the area is moderate, with the upland west of the site rising a little more than 80 feet above the stream at the damsite. The till is covered by a mantle of loess several feet thick.

The valley at the damsite has a relatively narrow bottom, and the abutment slopes are moderate to gentle, rising about 40 feet in a quarter of a mile. A saddle in the left abutment ridge limits development of a reservoir to an elevation of about 940 feet above sea level, which would provide a water depth of a little more than 20 feet at the dam.

Borrow material for dam construction is readily available from the weathered loess and till on the uplands.

This site is considered feasible for both damsite and reservoir as it is underlain by impervious till that has more than adequate bearing strength.

Site 2

Proposed site 2 is located largely in the NE¼ sec. 8, T. 46 N., R. 5 E., on a major tributary of West Branch Piscasaw Creek.

The damsite is located near the boundary of Winnebago till and of the deposit of outwash sand and gravel underlying the broad valley occupied by the main stems of Piscasaw and Lawrence Creeks. The hill northwest of the damsite, the lower part of which forms the right abutment, has been mapped as sand and gravel. The uplands are covered by a mantle of loess.

The valley at the damsite is broad, and the abutment slopes are gentle. A small saddle dike would be required in the right abutment in order to develop the reservoir to elevation 940 feet, which would be necessary to provide a water depth of a little more than 20 feet at the dam. Development to that elevation would cause the reservoir to extend into Wisconsin.

The damsite and part of the reservoir occupy a low-lying, poorly drained area containing peat and muck of undetermined thickness. In the

reservoir area, the peat and muck may be underlain by the relatively impervious Winnebago till. The reservoir sides are loess covered.

Adequate sources of borrow material can probably be developed in the loess and till in the near-by uplands.

The site is probably feasible for a shallow reservoir. Investigations should be carried out to determine foundation conditions, including whether till or gravel underlies the organic soils and how thick the undesirable surficial materials are.

Site 3

Proposed damsite 3 is located largely in the NW¼ sec. 29, T. 46 N. R. 5 E., on a tributary of Piscasaw Creek. The reservoir basin extends westward, covering the southern part of section 19 and the northern part of section 30.

The uplands in the vicinity of the damsite are underlain by the impervious, sandy, silty, clayey Winnebago till and covered by a mantle of loess. The valley bottom is a broad, low-lying, poorly drained area underlain by an unknown thickness of alluvium and highly organic soils including peat and muck. The valley area is extensively cultivated.

At the damsite the valley is about 1,500 feet wide, and the abutment slopes are moderately steep. Water-bearing outwash sand and gravel of unknown thickness probably underlies the surficial organic materials, with this, in turn, being underlain by the impervious Winnebago till. Loess-mantled Winnebago till forms both abutments.

The highly organic materials of the broad valley bottom would form the floor of the reservoir. In order to provide a little more than 30 feet of water depth at the dam and to bring the water's edge against the loess-covered Winnebago till, the reservoir would need to be developed to an elevation of about 910 feet. The outwash sand and gravel may underlie the surface organic soils throughout the reservoir area. An impermeable membrane would be necessary to prevent leakage through the sand and gravel if it is present beneath the dam.

Suitable borrow material can be obtained from the loess and till of the uplands near by. The alluvium and organic materials in the valley bottom would not be suitable for borrow.

The site is probably feasible for a reservoir. The deposits of surficial organic soils and alluvium and of the underlying water-bearing outwash sand and gravel may be thick enough to create some construction problems, and this should be determined by an adequate program of test boring.

Site 4

Proposed site 4 is located in the SW¼ sec. 5, T. 46 N., R. 6 E., on an intermittent drainage channel that drains part of the west slope of the West Chicago Moraine.

The damsite and reservoir area are underlain by the sandy, gravelly deposits characteristic of the West Chicago Moraine. While the impervious, pink Marengo till underlies the sand and gravel deposits, it is probably too deep to be encountered in the foundation for a dam. The abutments and the reservoir sides have moderate slopes.

Pervious borrow materials are available near the proposed site, but impervious materials would need to be brought in, probably from deposits of Marengo till west of the site.

This site is probably not feasible for a reservoir in which a relatively constant water level is desired. It might be used as a basin to catch and retard flood waters, but the drainage area contributing such waters is small. Leakage into the pervious sand and gravel probably would be rapid.

Site 5

Proposed site 5 is in the NE¼ sec. 10, T. 46 N., R. 6 E., on a headwater tributary of Nippersink Creek,which drains part of the backslope of the West Chicago Moraine.

The area is mapped as being underlain by the very sandy, gravelly materials deposited during the West Chicago episode of glaciation. The thickness of these materials varies, and their presence and thickness at the damsite would need to be determined by exploration. The impervious, pink Marengo till underlies the sandy, gravelly materials at very shallow depth and may be the topmost material beneath the surface soils. The abutments and the reservoir sides have moderate slopes, and probably consist of the pink Marengo till. The topographic map shows a small intermittent water body or bog on the upland east of the proposed reservoir. This may be a depression largely filled with impervious material, and if so, may not represent the true water level in the upland.

Pervious borrow materials are available from near-by uplands, but impervious borrow may need to be hauled a considerable distance unless it can be obtained from deposits of Marengo till near the damsite. Alluvial deposits from the valley bottom would not be suitable for borrow.

This site is probably feasible.

Site 6

The sixth site proposed for a dam and reservoir is located in the NE¼ sec. 15, T. 46 N., R 6 E., with the damsite just west of the line separating sections 14 and 15.

The proposed site occupies the west end of a low-lying, swampy, poorly drained area underlain by surficial deposits of silt and alluvium that contain peat and muck. The thickness of these surficial deposits is not known; they may be underlain either by pervious, water-bearing sand and gravel or by the relatively impervious Marengo till. The reservoir sides may consist of the pink, clayey, silty, sandy Marengo till covered by a few feet of West Chicago sand and gravel. The dam would need to be

founded on stable material below the surficial alluvium, peat, and muck, and an effective cut-off would be necessary to prevent underseepage.

Pervious borrow materials can be obtained from the granular deposits on the uplands north of the site. The closest source of impervious material is several miles away. The surficial alluvium from the valley floor would not be suitable construction material.

This site is probably feasible. The deposits of surficial organic soils and alluvium and of water-bearing granular materials may present construction problems. The proposed reservoir would contain a large proportion of shallow water.

Site 7

Site 7 is located largely in the NW¼ sec. 15, T. 46 N., R. 6 E., on an intermittent tributary of Nippersink Creek, which drains a portion of the West Chicago Moraine.

Except for a thin mantle of loess, the surficial deposit on the uplands consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. This deposit may not be more than 10 feet thick, and it may be absent at some places. It rests upon the thick, pink Marengo till, which extends well below the valley bottom. The deposits in the valley bottom are organic, silty, sandy alluvium that probably rests on the pink Marengo till.

The reservoir sides and the abutments and foundation at the proposed damsite consist largely of the pink, clayey, silty, sandy Marengo till, with the more sandy and gravelly materials above it. The Marengo till is relatively impervious and has adequate strength to support a dam.

Impervious borrow materials are available from deposits of Marengo till near by, but pervious borrow materials must be brought in.

This site is considered feasible.

Site 8

Proposed site 8 is located in the NE¼ sec. 16, T. 46 N., R. 6 E., on an intermittent tributary of Nippersink Creek. The tributary drains a part of the West Chicago Moraine.

Except for a thin mantle of loess, the surficial deposit in the vicinity of the site consists of silty, sandy, gravelly material. This deposit may be more than 10 feet thick and belongs to the West Chicago episode of glaciation. It rests on the thick, pink Marengo till, which extends well below the valley bottom.

The dam abutments and the sides of the proposed reservoir have moderately steep slopes. At the damsite, the foundation and the lower part of the abutments probably consist of the pink, clayey, silty, sandy Marengo

till; the sandy, gravelly material may be present in the upper part of the abutments and around the reservoir sides. The Marengo till is relatively impervious and has adequate strength to support a dam. Deposits of organic alluvium and colluvium cover the valley floor.

Impervious and pervious borrow materials are available from deposits near by. The organic alluvial and colluvial deposits in the swampy areas near the site are not suitable for borrow.

This site is probably feasible. A program of test boring and materials study would be required to develop information on the type, distribution, and characteristics of the foundation materials.

Site 9

Proposed damsite 9 is located in the NW¼ sec. 14, T. 45 N., R. 6 E., on a drainage course leading to Nippersink Creek, about midway between Harvard and Woodstock. The reservoir extends northward into section 11.

The proposed project is situated in an area believed to be underlain by relatively thin (0 to 10 feet), sandy, gravelly West Chicago till over the impervious, pink, clayey, silty, sandy Marengo till. The abutments and the sides of the proposed reservoir have gentle slopes.

The reservoir would occupy a valley through higher ground between two swampy areas. The thickness of alluvium and other surficial deposits at the damsite would need to be determined. If developed to an elevation of about 940 feet, the reservoir would have a depth of only about 20 feet at the dam.

Both pervious and impervious borrow materials can probably be obtained from the uplands near the site.

This site is probably feasible. Because of the likelihood of seepage through the sandy, gravelly West Chicago materials, the site might best be developed as a flood-retarding basin.

Site 10

Proposed damsite 10 is located near the center of sec. 20, T. 45 N., R. 6 E., on an intermittent tributary of North Branch Kishwaukee River.

The damsite and reservoir are located near the boundary of the pink, clayey, silty, sandy Marengo till and the overlying very sandy, gravelly West Chicago till. The Marengo is impermeable, but the West Chicago, being granular, drains freely. The abutments and reservoir sides have moderately steep slopes. If the stream course marks the contact between the Marengo and West Chicago tills, the right abutment and the right side of the reservoir would be on the impervious Marengo till, with the left abutment and the left side of the reservoir against the permeable

West Chicago till. However, it is more likely that the damsite and reservoir area are both underlain by Marengo till.

Impervious borrow materials can be obtained from the Marengo till west of the site. Pervious borrow materials can be obtained east of the site from the granular West Chicago till.

This site is probably feasible. If the left side of the reservoir lies against the granular, permeable West Chicago materials, it might be used primarily as a reservoir to catch and retard flood waters.

Site 11

Proposed site 11 is located near the center of sec. 19, T. 45 N., R. 6 E., near the headwaters of an intermittent tributary of North Branch Kishwaukee River. The tributary drains part of the Marengo Moraine.

The site lies wholly within the area underlain by the pink, clayey, silty, sandy Marengo till. The surface is covered by a thin mantle of loess. The abutments have moderately gentle slopes. The dam would be founded on the impermeable Marengo till, which is more than adequate to support a structure. Foundation and seepage problems would probably be minimal.

The reservoir would occupy part of a swampy area at the head of the valley. Development to an elevation of 980 feet would be necessary in order to have 20 feet of water at the dam, and a dike would be required on the west side of the reservoir if development to this elevation were considered.

Borrow materials can be obtained from the Marengo till and in the uplands near by. The alluvium and organic materials that underlie the swampy areas would not be suitable for borrow materials.

This site is considered feasible, as both damsite and reservoir area are underlain by impervious till that has more than adequate bearing strength.

In October, 1968, a golf course was being constructed on a tract that includes the proposed site, making it unlikely that it will be used as a reservoir.

Site 12

Proposed site 12 lies in the NE¼ sec. 30, T. 45 N., R. 6 E., on an intermittent tributary of North Branch Kishwaukee River. The tributary drains part of the Marengo Moraine. The site is about midway between Harvard and Woodstock.

The valley is about 800 feet wide at an elevation of 910 feet, and below this elevation it has a very gently sloping cross-section. Above 910 feet, the abutments have moderate slopes. The valley has a broad, flat bottom throughout the reservoir area.

The damsite is located near the boundary of the impervious Marengo till and the variably textured sand that fills the broad valley occupied by North Branch Kishwaukee River. The uplands are covered with a thin mantle of loess. The upper parts of both abutments consist of Marengo till and present no particular problem, but the valley bottom may be underlain by the variably textured sand, which would require a cut-off to prevent seepage under a dam. By shifting the location of the damsite upstream a short distance, it may be possible to found the dam entirely on Marengo till, but this needs verification by exploration. Deposits of organic alluvium and colluvium cover the valley bottom.

Topographically, it appears possible to develop a reservoir at this site to about elevation 930 feet, which would provide a fairly large lake with water nearly 30 feet deep at the dam. The reservoir sides have moderate slopes consisting of Marengo till.

Both pervious and impervious borrow materials are available near by.

Site 12 is feasible. Investigations should be carried out to determine the thickness of sand in the valley bottom and to locate the best position for the dam axis.

Site 13

Proposed site 13 is largely in the SE¼ sec. 31, T. 45 N., R. 6 E., on an intermittent tributary of North Branch Kishwaukee River. The tributary drains a part of the Marengo Moraine.

The site is on a terrace of sand and gravel deposits that are probably less than 20 feet thick. Marengo till underlies the sand and gravel.

Both dam and reservoir would be entirely within the area underlain by pervious sand and gravel. The abutments and reservoir sides have very gentle slopes, and the reservoir would be very shallow, perhaps 10 feet deep at the dam.

Both pervious and impervious borrow materials are available from near-by areas. Sand and gravel have been produced from several pits in the terrace.

This site is probably not feasible because of the probability of rapid seepage of water from the reservoir into the pervious sand and gravel, and because the reservoir would be too shallow for a desirable recreational pond. It might be possible to develop the site as a flood-retarding basin.

Site 14

Proposed damsite 14 is in the SW¼ sec. 8, T. 44 N., R. 6 E., on an intermittent tributary of North Branch Kishwaukee River. The tributary drains part of the Marengo Moraine. The reservoir area extends westward into section 7.

The site lies completely within the area underlain by the impervious, pink, clayey, silty, sandy Marengo till. The surface is covered by a thin mantle of loess. The abutments and the reservoir sides have moderately steep slopes. The reservoir would be more than 20 feet deep at the dam.

Both pervious and impervious borrow materials are available near by.

This site is feasible, and no serious foundation or seepage problems are anticipated.

Site 15

Proposed site 15 lies in the S½ sec. 17, T. 44 N., R. 6 E., on two intermittent tributaries of North Branch Kishwaukee River that drain part of the Marengo Moraine. The site is about 3 miles northeast of Marengo.

The site is situated in a broad reentrant that is underlain by the same variably textured sand that underlies the broad valley occupied by North Branch Kishwaukee River. The sand probably underlies the entire reservoir area and most, if not all, of the proposed damsite. The upland north of the damsite consists of the pink, clayey, silty, sandy Marengo till. The upland south of the damsite is mapped as consisting of yellowish pink, silty, sandy till belonging to the Gilberts till complex. The thickness of the sand at the damsite should be determined for design purposes.

The reservoir would be very shallow, with the water at the dam a little more than 10 feet deep, if the water level were developed to an elevation of 850 feet. Seepage under and around the ends of the dam could be a serious problem unless an effective cut-off were installed.

Sources of both pervious and impervious borrow materials are probably available near by.

This site is probably feasible as a basin to catch and retard flood waters, but because of the possibility of excessive seepage into the sand, it is probably not feasible as a reservoir in which a relatively constant water level is desired.

McHENRY QUADRANGLE

Site 16

Proposed site 16 is largely in the E½ sec. 6, T. 46 N., R. 7 E., in a ravine that drains southward into a large swampy area. The site is about 2 miles northwest of Hebron.

In the vicinity of the site, the pink Marengo till is overlain by a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. The West Chicago till may be absent at

some places. Locally in the area, West Chicago sand and gravel is interposed between the Marengo till and the West Chicago till. Its presence at the damsite should be determined by drilling or excavating. A thin mantle of loess forms the uppermost surficial deposit. The low-lying area south of the site is underlain by organic, silty, alluvial deposits that may include peat and muck.

The damsite and reservoir are probably underlain by the pink, clayey, silty, sandy Marengo till. This till is relatively impervious and has adequate strength to support a dam. The abutments and reservoir sides have moderate slopes. A reservoir developed to an elevation of 930 feet would be less than 20 feet deep at the dam. Deposits of West Chicago till or sand and gravel may be present at places around the sides of the reservoir.

Impervious borrow materials can be obtained from deposits of the Marengo till near by, and pervious borrow materials are available in the vicinity.

This site is probably feasible.

Site 17

Site 17 is near the center of sec. 9, T. 46 N., R. 7 E., in a ravine that drains northward into a large swampy area. There is an intermittent stream in the ravine. The proposed site is about half a mile northeast of Hebron.

The entire site area is underlain by sand and gravel. The surficial deposit beneath a thin mantle of loess consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. The West Chicago till rests on a deposit of sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions that existed on older deposits. It is difficult to distinguish the West Chicago till from the underlying deposit of sand and gravel, and it is likely that the West Chicago till is absent at some places.

The abutments and the sides of the ravine have moderate to gentle slopes. Developed to an elevation of 900 feet, the reservoir would be little more than 10 feet deep. Pervious sand and gravel underlie the damsite and the entire reservoir area, and leakage would be a severe problem.

Pervious borrow materials are available near by, but impervious borrow materials are several miles away. The materials in the swampy area are not suitable for borrow.

This site is not considered feasible owing to the probability of serious leakage under and around a dam and from the bottom and sides of the reservoir.

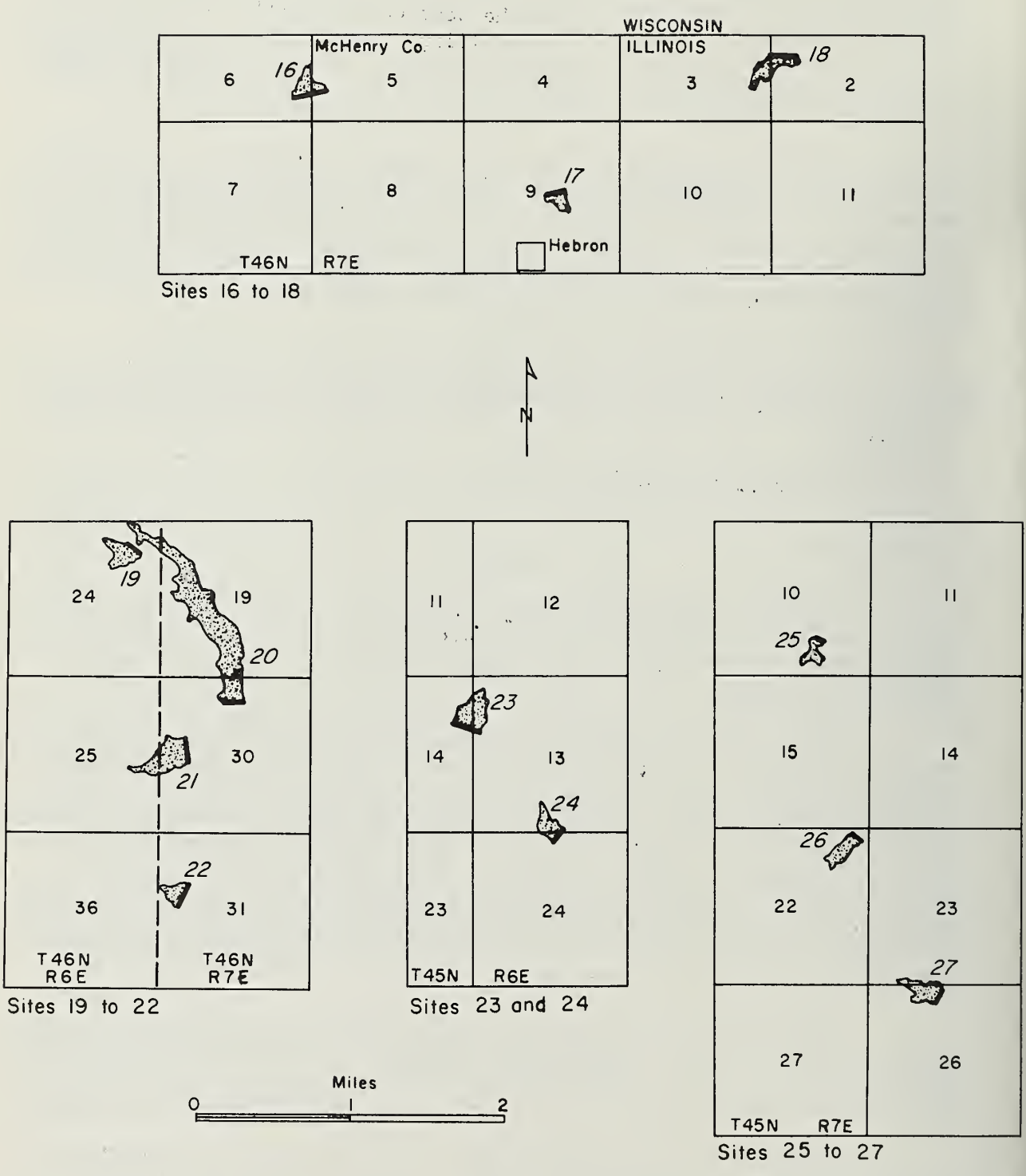

Fig. 3. Proposed dam and reservoir sites 16 to 27 in the McHenry Quadrangle.

Site 18

Proposed site 18 lies in the SW¼ sec. 2, T. 46 N., R. 7 E., about 2 miles northeast of Hebron, at the edge of a low-lying, swampy area.

The entire area is underlain by sand and gravel. In the swampy areas the uppermost deposits are organic, silty, sandy alluvium that may contain some peat and muck. In the higher areas the surface deposit consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. The West Chicago till rests upon a deposit of sand and coarse gravel of highly varied texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions that existed on older deposits. It is difficult to distinguish the West Chicago till from the underlying deposit of sand and gravel, and the West Chicago till is likely to be absent at some places.

Leakage would be a severe problem if the reservoir were in contact with the pervious sand and gravel deposits.

Pervious borrow materials are available near by, but the closest impervious borrow materials are several miles away. The organic materials in the swampy area are not suitable for borrow.

This site is not feasible. Leakage under and around a dam and from the sides of the reservoir would be a serious problem.

Site 19

Proposed site 19 is in the NE¼ sec. 24, T. 46 N., R. 6 E., about 2½ miles southwest of Hebron, on an intermittent tributary of Nippersink Creek.

Except for a thin mantle of loess, the surficial deposit in the vicinity of the site is a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. This deposit is probably not more than 10 feet thick, and it may be absent at some places. It rests upon the thick, pink Marengo till, which extends well below the valley bottom.

The damsite and reservoir are underlain by the pink, clayey, silty, sandy Marengo till, which has adequate strength to support a dam and is relatively impervious. The abutments and reservoir sides have moderately steep slopes. A reservoir developed to an elevation of 950 feet would be a little more than 20 feet deep at the dam. Deposits of the sandy West Chicago till may be present at places around the sides of the reservoir, and these could provide avenues of leakage. However, three small lakes have already been developed successfully above the 950-foot elevation in a near-by draw.

Impervious borrow materials can be obtained from deposits of Marengo till near by, but pervious borrow materials are several miles away.

This site is feasible.

Site 20

Proposed site 20 is located largely in the W½ sec. 19, T. 46 N., R. 7 E., with the damsite in the NW¼ sec. 30, T. 46 N., R. 7 E. The upper end of the reservoir would extend into the NE¼ sec. 24 and possibly the SE¼ sec. 13, T. 46 N., R. 6 E. The site is on the main stem of Nippersink Creek about 2½ miles southwest of Hebron.

In the site area, Nippersink Creek occupies a prominent valley cut across an upland that rises about 100 feet above the stream. The flat valley bottom, or floodplain, is 500 to 600 feet wide. The valley sides in the reservoir area have moderately steep to steep slopes, and the abutments have moderately steep slopes.

Except for a thin mantle of loess, the surficial deposit in the vicinity is a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. This deposit may not be more than 10 feet thick and at some places may be absent. It rests upon the thick, pink Marengo till, which extends well below the valley bottom. The floodplain deposits consist of organic, silty, sandy alluvium and may be more than 5 feet thick. They probably rest on the Marengo till.

The abutments at the proposed damsite and the reservoir sides are pink, clayey, silty, sandy Marengo till, which is relatively impervious and has adequate strength to support a dam.

Impervious borrow materials can be obtained from deposits of Marengo till near by, but it would be necessary to get pervious borrow materials several miles away. Gravel has been taken from a small pit in the southwest quarter of section 30. The silty alluvial deposits in the valley bottom are organic and would not be suitable for borrow.

This site is feasible, and no serious problems are anticipated.

Site 21

Proposed site 21 is largely in the W½ sec. 30, T. 46 N., R. 7 E., about 3 miles southwest of Hebron, on an intermittent tributary of Nippersink Creek.

Except for a thin mantle of loess, the surficial deposit in the vicinity of the site consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. This deposit may be more than 10 feet thick, and it may be absent at some places. It rests upon the thick, pink Marengo till that extends well below the valley bottom.

The damsite and reservoir probably are underlain by the pink, clayey, silty, sandy Marengo till. The till has adequate strength to support a dam and is relatively impervious. The abutments and reservoir sides have moderately steep slopes. A reservoir developed to an elevation of 950 feet would be between 20 and 30 feet deep at the dam. Deposits of

the sandy West Chicago till may be present at places around the sides of the reservoir, and these could provide avenues of leakage.

Impervious borrow materials are available from deposits of Marengo till near the damsite, but pervious borrow materials may not be. Sand and gravel have been taken from a pit in the southwest quarter of section 30, and this deposit might be a source of some pervious borrow.

This site is probably feasible.

Site 22

Proposed site 22 lies in the NW¼ sec. 31, T. 46 N., R. 7 E., about 4 miles southwest of Hebron, on an intermittent stream that drains the east slope of the upland.

Except for a thin mantle of loess, the surficial deposit in the vicinity of the site consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. This deposit may be more than 10 feet thick, and it may be absent at some places. It rests on the thick, pink Marengo till, which extends well below the valley bottom.

The abutments and the reservoir sides have gentle slopes. The damsite and reservoir probably are underlain by the pink, clayey, silty, sandy Marengo till, but abutment materials might possibly consist of sand and gravel. The till is relatively impervious and has adequate strength to support a dam. A reservoir developed to an elevation of 970 feet would be about 20 feet deep at the dam. Deposits of the sandy West Chicago till may be present at places around the sides of the reservoir, or possibly in the abutments, and these could provide avenues of leakage.

Impervious borrow materials are available from deposits of Marengo till near the damsite. Sand and gravel have been taken from a deposit located about half a mile north of the site, and this deposit might be developed as a source of some pervious borrow.

This site is probably feasible.

Site 23

Proposed site 23 is located in the NW¼ sec. 13 and the NE¼ sec. 14, T. 45 N., R. 6 E., about 5 miles northwest of Woodstock, on an intermittent stream leading to Nippersink Creek.

Except for a thin mantle of loess, the surficial deposit in the vicinity of the site consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. The deposit is probably not more than 10 feet thick, and it may be absent at some places. It rests on the thick, pink, clayey, silty, sandy Marengo till, which extends well below the valley bottom.

The abutments and the reservoir sides have gentle to moderate slopes. Deposits of organic, silty, mucky alluvium underlie the broad, gently sloping valley floor. The damsite and reservoir are believed to be underlain by the relatively impervious, pink Marengo till. Deposits of the sandy West Chicago till may be present, which could provide avenues of leakage.

Both pervious and impervious borrow materials can probably be obtained from the uplands near the site. The organic, silty, alluvial deposits from swampy areas are not suitable for borrow.

This site is probably feasible.

Site 24

Proposed site 24 is in the NW¼ sec. 24 and the SW¼ sec. 13, T. 45 N., R. 6 E., about 4 miles northwest of Woodstock. The site is on an intermittent stream that drains into a tributary of Nippersink Creek.

The damsite and reservoir area are underlain by deposits of the Marengo till complex, which consists largely of the pink, clayey, sandy Marengo till with possible intermixtures of younger deposits. The abutments of the dam have moderately steep slopes, and the slopes of the reservoir sides are also moderate. Developed to an elevation of 930 feet, the reservoir would be about 20 feet deep at the dam. The Marengo till complex is relatively impervious, and it has adequate strength to support a dam. No serious problems are anticipated.

Impervious borrow materials are available near by from the deposits of the Marengo till complex. Pervious borrow materials can probably be obtained from the deposits of sand and gravel that overlie the Marengo till in the surrounding area. Deposits of organic alluvium from the low-lying area generally east of the site are not suitable for borrow.

This site is feasible.

Site 25

Proposed site 25 lies in the SE¼ sec. 10, T. 45 N., R. 7 E., about 2 miles west of Wonder Lake, on a short, intermittent tributary of Nippersink Creek.

Except for a thin mantle of loess, the surficial deposit in the general area of the proposed site consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. This deposit is probably not more than 10 feet thick and it may be absent at some places. It rests upon the fairly uniform textured, gray, pebbly, silty, clayey Marseilles till.

The abutments have moderately steep slopes, and the dam would probably be founded largely on the impervious Marseilles till. This would

be a satisfactory foundation material as it has adequate strength and is relatively impervious.

The sides of the reservoir have moderate slopes that become more gentle toward the upper end where sand and gravel deposits of the West Chicago till are probably present. Developed to an elevation of 860 feet, the reservoir would be about 20 feet deep at the dam.

Impervious borrow materials can be obtained from deposits of Marseilles till near by, but pervious borrow materials may need to be brought in. Sand and gravel has been extracted from pits within 3 miles of the site.

This site is probably feasible.

Site 26

Proposed site 26 is located in the NE¼ sec. 22, T. 45 N., R. 7 E., in a ravine about 1½ miles west of Wonder Lake.

Geologically, the site is in an area where a few feet of gravelly, sandy West Chicago till overlie the impervious, gray, pebbly, silty, clayey Marseilles till. East of the site, a variable thickness of sand and coarse gravel underlies the West Chicago till. This deposit filled valleys and depressions in older deposits, including the Marseilles till, and its western boundary near the proposed site is imperfectly known. It may be significant that the intermittent stream in the ravine sinks into the ground and loses its identity as a stream, indicating pervious materials beneath the surface. There is a thin mantle of loess at the surface.

This site is well up on the upland and the abutments consist of sand and gravel. Marseilles till may be present beneath a few feet of alluvial deposits in the bottom of the ravine. The reservoir would be shallow. It is underlain by sand and gravel, and leakage would probably be a problem.

Pervious borrow material is available from the uplands near by. Gravel has been taken from pits between a mile and 2 miles from the site. Impervious borrow materials would need to be brought in unless a source can be developed in the Marseilles till beneath the surficial deposits of sand and gravel.

This site is probably not feasible. Leakage through the surficial deposits of sand and gravel would be the principal problem.

Site 27

Proposed site 27 is largely in the NW¼ sec. 26, T. 45 N., R. 7 E., but part of the reservoir area extends into the SW¼ sec. 23, T. 45 N., R. 7 E., about 4 miles northeast of Woodstock.

The entire area is underlain by pervious sand and gravel. At the damsite, the surficial deposit, beneath a thin mantle of loess, consists of

sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions on older deposits. The intermittent stream that passes through the area sinks into the ground and loses its identity as a stream about a quarter of a mile downstream from the damsite, revealing the pervious character of the underlying deposits. Along the north side of the proposed reservoir, deposits of the thin, sandy, gravelly West Chicago till may be present. It is difficult to distinguish between the West Chicago till and the sand and gravel that underlies it, for when the West Chicago till is exposed at the surface it appears as loose sand and gravel.

The abutments and reservoir sides have moderate slopes. Developed to an elevation of 890 feet, the reservoir would be a little more than 20 feet deep at the dam; it would be relatively small. Leakage into the pervious sand and gravel deposits that underlie the site would be severe.

Pervious borrow materials are available near by, but impervious borrow materials would need to be brought in from several miles away. The organic, alluvial materials from swampy areas are not suitable for borrow. Gravel has been taken from a pit southwest of the damsite.

This site is not feasible.

Site 28

Proposed site 28 is in the SW¼ sec. 18, T. 44 N., R. 7 E., about 2½ miles southwest of Woodstock, on an intermittent tributary of the Kishwaukee River.

The stream drains an area underlain by the gray, pebbly, silty, clayey Marseilles till, which has fairly uniform texture and is relatively impervious. The till is covered by a thin mantle of loess.

The abutments have gentle slopes and consist of the Marseilles till. The valley bottom is also underlain by Marseilles till, but a few feet of alluvial deposits are present at the surface. No serious foundation problems are anticipated.

The valley upstream from the proposed damsite is broad, and swampy conditions have existed there. Marseilles till underlies the reservoir bottom and sides, but the upper few feet of material in the valley bottom is organic, silty alluvium. Developed to an elevation of 900 feet, the reservoir would be less than 20 feet deep at the dam.

Impervious borrow materials are available near by from deposits of the Marseilles till, but pervious borrow materials are several miles away. The alluvial material in the valley bottom is not suitable for borrow.

This site is feasible.

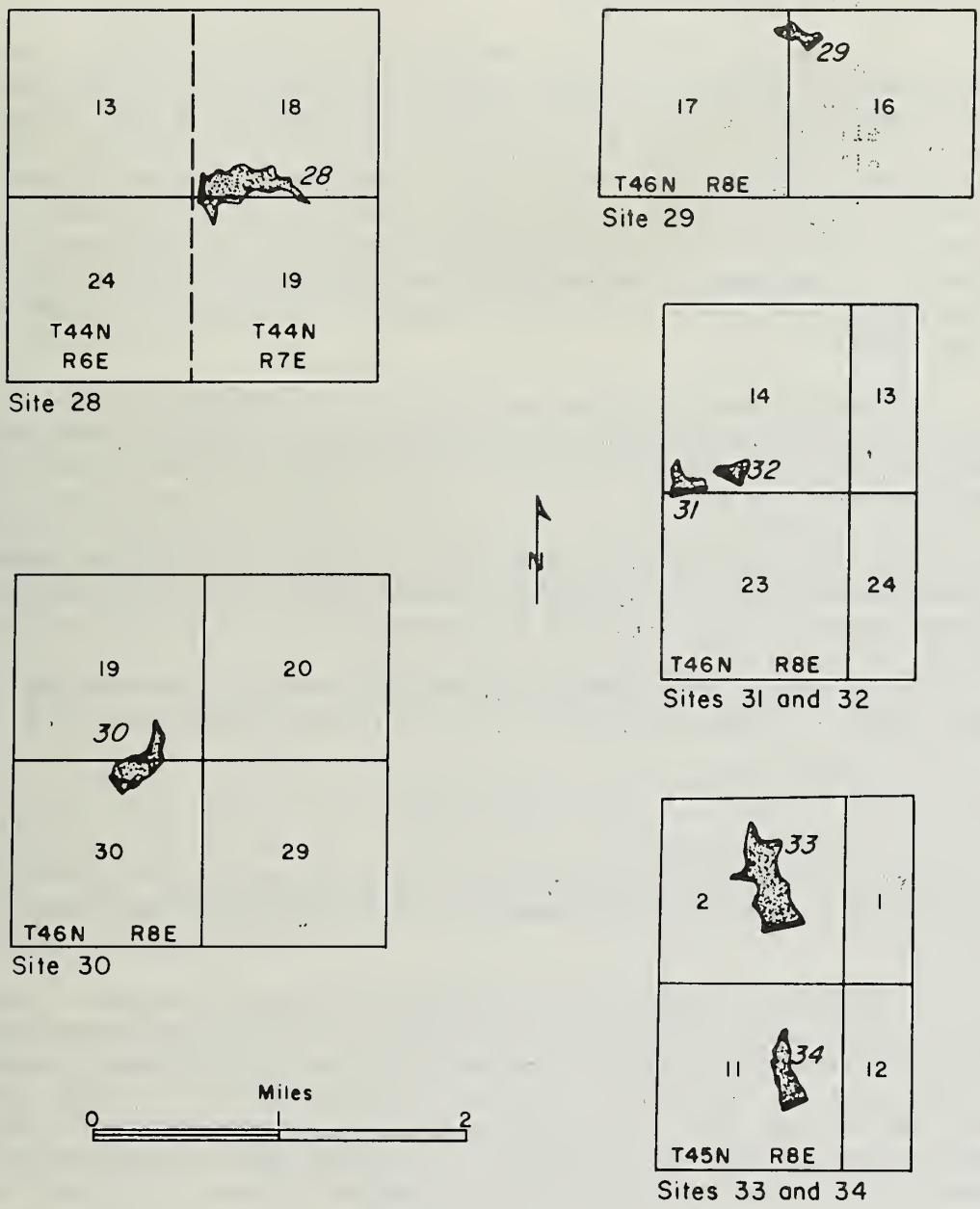

Fig. 4. Proposed dam and reservoir sites 28 to 34 in the McHenry Quadrangle.

Site 29

Proposed site 29 is located in the NW¼ sec. 16, T. 46 N., R. 8 E., about half a mile southwest of Richmond, on an intermittent stream that drains into a large swampy area.

The entire site area is underlain by sand and gravel. Beneath a thin mantle of loess, the surficial deposit consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. The West Chicago till rests on a deposit of sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions on older deposits. It is difficult to distinguish the West Chicago till from the underlying deposit of sand and gravel, and it is likely that the West Chicago till is absent at some places.

The abutments and reservoir sides have moderate slopes, and the reservoir would be about 20 feet deep at the dam. Pervious sand and gravel probably underlie the damsite and the entire reservoir area, and leakage would be a problem.

Pervious borrow materials are available near by, but impervious materials would need to be brought in. The organic alluvial deposits in the swampy area are not suitable for borrow.

This site is probably not feasible, owing to the probability of leakage under and around a dam and from the bottom and sides of the reservoir.

Site 30

Proposed site 30 is largely in the NE¼ sec. 30, T. 46 N., R. 8 E., about 3 miles southwest of Richmond, on an intermittent tributary of Nippersink Creek.

The entire site area is underlain by sand and gravel. Except for a thin mantle of loess and some alluvial and colluvial deposits in the valley, the surficial deposit consists of a few feet of sandy, gravelly West Chicago till, which, when exposed at the surface, is loose, gravelly sand. The West Chicago till rests on sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions that existed on older deposits. It is difficult to distinguish the West Chicago till from the underlying deposit of sand and gravel, and it is likely that the West Chicago till is absent in some places.

The abutments and the sides of the reservoir have moderate slopes. Developed to an elevation of 860 feet, the reservoir would be about 20 feet deep at the dam. Permeable sand and gravel underlie the damsite and the entire reservoir area, and leakage is likely to be a problem.

Pervious borrow materials are available near by, but impervious borrow materials would need to be brought in from several miles away. The

alluvial and colluvial materials in the valley bottom and in near-by swampy areas are not suitable for borrow.

This site is probably not feasible. Leakage would be the principal problem.

The landowner has developed a pond by excavating the organic, clayey alluvium from the valley bottom to form a surrounding dike. Sand and gravel from a near-by deposit was used to surface the dike.

Site 31

Proposed site 31 is in the SW¼ SW¼ sec. 14, T. 46 N., R. 8 E., about 2 miles southeast of Richmond, on an intermittent tributary of Nippersink Creek.

The entire site area is mapped as being underlain by sand and gravel, but there is a possibility that the impervious, pink, clayey, silty, sandy Marengo till is present at shallow depth. Except for a mantle of loess, the uppermost deposit in the area may consist of a few feet of sandy, gravelly West Chicago till. It rests on a deposit of sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions that existed on older deposits. These sand and gravel units may be very thin or absent at this site. According to the resident farmer, there are no sand and gravel deposits on this farm, and the ground is clayey rather than sandy and gravelly.

The abutments and reservoir sides have gentle slopes. Developed to an elevation of 830 feet, the reservoir would be about 20 feet deep at the dam but would be small. Whether the damsite and reservoir area are underlain by pervious sand and gravel or by a relatively impervious till unit such as the Marengo, or possibly even the Marseilles, will need to be determined by exploration.

Sources of pervious and impervious borrow materials can probably be developed in the vicinity. The organic alluvium and colluvium present in the bottoms of drainageways are not suitable for borrow.

This site is probably feasible. If it is underlain by permeable sand and gravel, an adequate cut-off would be required to prevent serious leakage. The site could be used as a basin to catch and retard flood waters.

Site 32

Proposed site 32 is in the SE¼ SW¼ sec. 14, T. 46 N., R. 8 E., about 2 miles southeast of Richmond, on an intermittent tributary of Nippersink Creek.

The entire site area is mapped as being underlain by sand and gravel, but there is a possibility that the impervious, pink, clayey, silty, sandy Marento till is present at shallow depth. Except for a mantle of

loess, the uppermost deposit in the area may consist of a few feet of sandy, gravelly West Chicago till. The till rests upon a deposit of sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions on older deposits. These sand and gravel units may be very thin or absent at this site. The resident farmer has found no sand and gravel deposits on this farm, and the ground is clayey rather than sandy and gravelly.

The abutments and reservoir sides have gentle slopes. The bottom of the valley formerly was marshy, and deposits of organic, silty alluvium and colluvium are present. The reservoir would be about 20 feet deep at the dam, but it would be small. Whether the damsite and reservoir area are underlain by pervious sand and gravel or by a relatively impervious till unit such as the Marengo, or possibly even the Marseilles, will need to be determined by exploration.

Sources of pervious and impervious borrow materials can probably be developed in the vicinity. The organic alluvium and colluvium present in the bottoms of drainageways are not suitable for borrow.

This site is probably feasible. If it is underlain by pervious sand and gravel, an adequate cut-off would be required to prevent serious leakage. The site could be used as a basin to catch and retard flood waters.

Site 33

Proposed site 33 is located near the center of sec. 2, T. 45 N., R. 8 E., about 4 miles north of McHenry, on an intermittent tributary of the Fox River.

The entire site area is underlain by sand and gravel. Except for a thin mantle of loess, the surficial deposit consists of a few feet of sandy, gravelly West Chicago till, which, at surface exposures is loose, gravelly sand. The till rests on a deposit of sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled the valleys and depressions of older deposits. It is difficult to distinguish the West Chicago till from the underlying deposit of sand and gravel, and it is likely that it is absent at some places. The impervious, pink Marengo till may be present at relatively shallow depth but is probably too deep to be encountered in a dam foundation.

The abutments have moderate slopes and the reservoir sides have moderate to gentle slopes. Developed to an elevation of 860 feet, the reservoir would be about 20 feet deep at the dam, but a large part of it would be less than 10 feet deep. Permeable sand and gravel underlie the damsite and the entire reservoir area, and leakage would be a problem. Organic alluvial and colluvial deposits cover the valley bottom.

Pervious borrow materials can be obtained near by, but impervious materials would need to be brought from several miles away. Materials from swampy areas are not suitable for borrow.

The site is probably not feasible for a reservoir in which a relatively constant water level is desired, owing to the probability of severe leakage under and around a dam and from the bottom and sides of the reservoir. It is feasible for a basin to catch and retard flood waters.

Site 34

Proposed site 34, in E½ sec. 11, T. 45 N., R. 8 E., is about 3 miles north of McHenry on an intermittent tributary of the Fox River.

The entire site area is underlain by sand and gravel. Except for a thin mantle of loess, the uppermost deposit consists of a few feet of sandy, gravelly West Chicago till, which is loose, gravelly sand when exposed at the surface. The West Chicago till overlies a deposit of sand and coarse gravel of highly variable texture that was deposited in front of the advancing West Chicago glacier. The thickness of this deposit varies because it filled valleys and depressions on older deposits. It is difficult to distinguish the West Chicago till from the underlying sand and gravel, and it is likely that the West Chicago till is absent at some places. The impervious, pink Marengo till may be present at relatively shallow depth but is probably too deep to be encountered in a dam foundation.

The sand and gravel deposit that occurs stratigraphically below the West Chicago till underlies the damsite and reservoir area. The West Chicago till is present on the uplands around the reservoir. The abutments and sides of the reservoir have moderate to moderately steep slopes. Developed to an elevation of 810 feet, the reservoir would be about 20 feet deep at the dam. Leakage into the pervious sand and gravel that underlie the entire site would be a problem. Organic alluvial and colluvial deposits cover the valley bottom.

Pervious borrow materials can be obtained near by, but impervious borrow materials are several miles away. The organic alluvial materials from swampy areas are not suitable for borrow.

This site is probably not feasible for a reservoir in which a relatively constant water level is desired, but it could be used as a basin to catch and retard flood waters.

GRAYSLAKE QUADRANGLE

Site 35

Proposed site 35 is in the N½ sec. 7, T. 46 N., R. 9 E., on an intermittent stream that disappears into permeable materials about a quarter of a mile downstream from the damsite.

In the vicinity of the damsite and reservoir, the area is underlain by a thin deposit of sandy, gravelly West Chicago till, which overlies

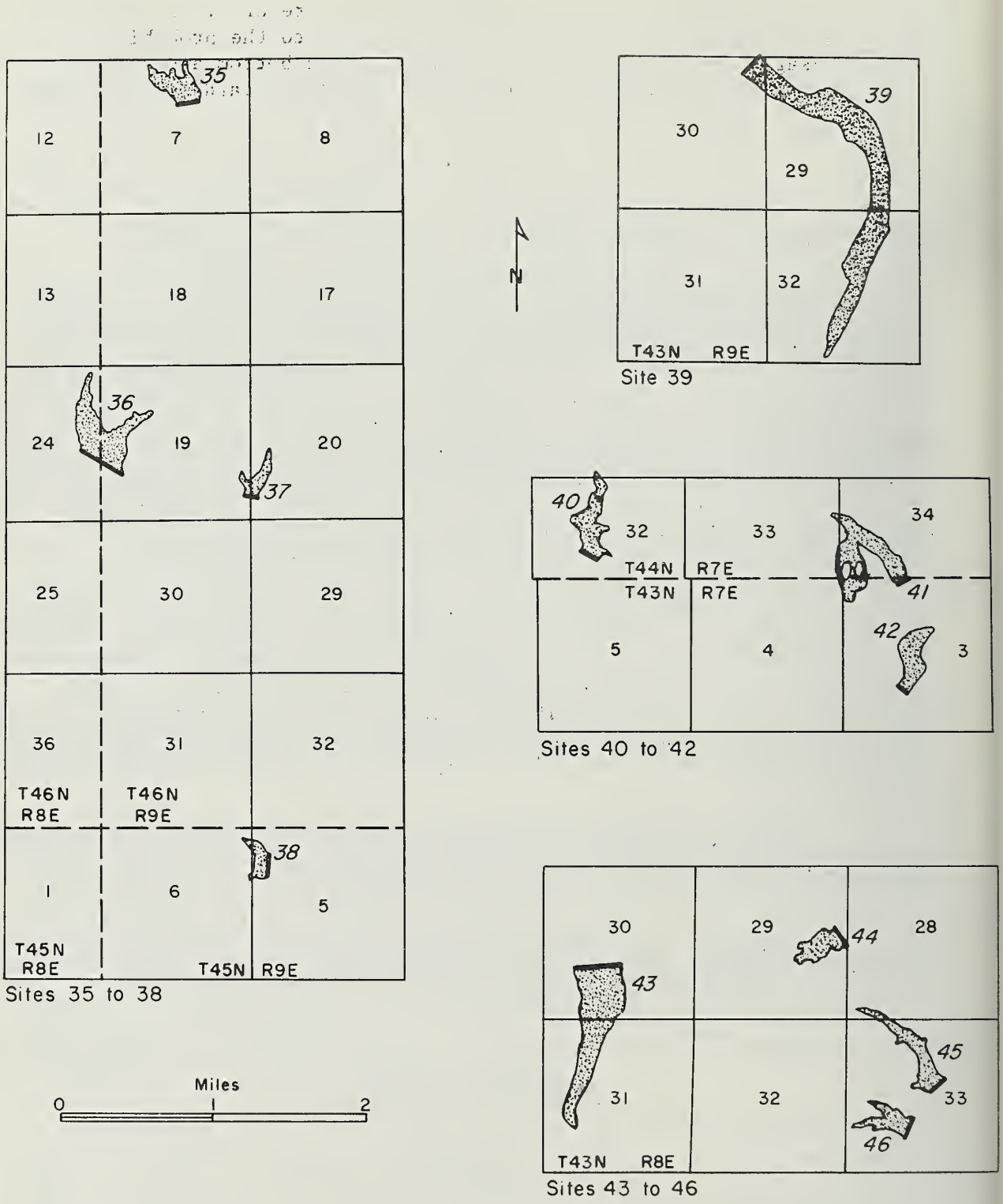

Fig. 5. Proposed dam and reservoir sites 35 to 46 in the McHenry County parts of the Grayslake, Barrington, and Elgin Quadrangles.

a thick deposit of coarse sand and gravel of highly variable texture. It is into this material that the stream disappears. The uplands are covered with a thin mantle of loess.

The abutments at the proposed damsite have moderate to gentle slopes and consist largely of sand with a little loess on top. The West Chicago till unit is probably present, but it is largely sand and gravel and would do little to improve the water-holding capability of the abutments. The bottom of the drainageway is marshy, and the surface material is a black, organic sand about 2 feet thick. Many large boulders are partly buried in the sand. A soft, wet clay underlies the organic sand. The landowner has excavated a small pond that holds water at ground-water level.

The reservoir sides have gentle slopes and are underlain largely by sand and some gravel.

Pervious borrow materials are available near by. Sand and gravel have been produced from a pit a short distance from the proposed damsite. Impervious borrow materials would need to be obtained several miles away.

This site is probably not feasible for a reservoir in which a relatively constant water level is desired, owing to the probability of excessive leakage into the pervious sand around the sides of the reservoir. The site is feasible as a basin to catch and retard flood waters.

Site 36

Proposed site 36, in the E½ sec. 24, T. 46 N., R. 8 E., and the W½ sec. 19, T. 46 N., R. 9 E., is just north of Spring Grove on a tributary of Nippersink Creek.

The damsite and reservoir are underlain by the thick, permeable, coarse sand and gravel of highly variable texture that was deposited just prior to the advance of the West Chicago glacier. The surface is covered by a thin mantle of loess. In the site area the valley floor is broad and is covered with deposits of organic alluvium and colluvium. The abutments and reservoir sides have moderate slopes and consist of sand and gravel. If developed to an elevation of about 800 feet, the reservoir would be about 20 feet deep at the dam and would have two principal upstream arms.

A small lake has been developed in the upper end of the east arm. Severe leakage was encountered when the lake level was raised to flood a gravel pit near the head of the lake. It was reported that this problem was overcome by spreading loessial topsoil over the sides and bottom of the gravel pit. The existing lake probably rests in a basin of sand and gravel lined with undisturbed topsoil. The topsoil serves as an impermeable membrane that reduces or prevents leakage into the sand and gravel.

Pervious borrow materials are available near by. Gravel has been taken from a pit about a mile northeast of Spring Grove. Impervious borrow material would need to be obtained several miles away. The organic alluvial and colluvial deposits in the valley bottom are not suitable for borrow material.

This site is probably feasible provided there is a sufficient thickness of undisturbed, impervious topsoil over the entire reservoir area to prevent excessive leakage into the sand and gravel. If the impervious topsoil is thin or absent over large areas, the site would probably not be feasible for a reservoir in which a relatively constant water level is desired. The site is feasible as a basin to catch and retard flood waters.

Site 37

Proposed site 37 is in the SE¼ sec. 19 and the SW¼ sec. 20, T. 46 N., R. 9 E., about a mile east of Spring Grove, on an intermittent tributary of Nippersink Creek.

The damsite and reservoir are underlain by thick, permeable, coarse sand and gravel of highly variable texture that was spread over the area just in front of the advancing West Chicago glacier. A thin deposit of loess mantles the uplands. The abutments have moderate slopes and consist of sand and gravel. The reservoir sides have moderate to gentle slopes. The bottom and sides of the reservoir are sand and gravel. If developed to an elevation of about 820 feet, the reservoir would be about 20 feet deep at the dam.

Pervious borrow materials are available near by. Gravel has been extracted from a pit about three-quarters of a mile northwest of the proposed damsite. Impervious borrow materials would need to be obtained several miles away.

This site is probably not feasible for a reservoir in which a relatively constant water level is desired because of the probability of excessive leakage into the permeable sand and gravel. However, it could be used as a basin to catch and retard flood waters. There is a small stock pond in the ravine.

Site 38

Proposed damsite 38 lies in the NW¼ sec. 5, T. 45 N., R. 9 E., about 2 miles southeast of Spring Grove, on an intermittent tributary of Nippersink Creek. The reservoir would extend northwestward into the northwest quarter of section 6.

The damsite is near the boundary between a deposit of thick, coarse sand and gravel of highly variable texture and the overlying thin West Chicago till, which is itself largely sand and gravel. Both of these units are permeable. The abutments and the reservoir sides have moderate slopes and consist of sand and gravel. Organic alluvium and colluvium cover the valley bottom.

Pervious borrow materials are available near by. Gravel has been taken from a small pit located in the northeast quarter of section 6 near the upper end of the reservoir. Impervious borrow materials would need to be obtained several miles away.

This site is probably not feasible for a reservoir in which a relatively constant water level is desired because of the probability of excessive leakage into the pervious sand and gravel deposits. However, it would be feasible as a basin to catch and retard flood waters.

BARRINGTON QUADRANGLE

Site 39

Proposed site 39 is located on Spring Creek in the extreme southeast corner of McHenry County, about 2 miles southeast of Cary. The damsite is largely in the NE¼ sec. 30, T. 43 N., R. 9 E. The reservoir area extends southward through sections 29 and 32 to the south boundary of McHenry County.

The damsite and reservoir area are underlain by deposits of coarse sand and gravel belonging to the West Chicago glaciation. These deposits may be as much as 80 or 100 feet thick and have highly variable texture. They underlie the sandy, gravelly West Chicago till. The stream channel and the broad valley bottom are underlain by surficial deposits of organic, silty alluvium, possibly including peat and muck, that are more than 5 feet thick and mask the underlying sand and gravel. Sand and gravel are exposed at places along the reservoir sides.

The foundation and abutments of the proposed dam consist of sand and gravel. An effective cut-off to prevent excessive seepage under and around the ends of the dam would be a necessary part of the dam design.

Throughout the reservoir area the valley bottom is broad and very gently sloping. The reservoir could be developed to an elevation of only 768 feet without backing water into Cook County. If developed to that elevation, the reservoir would be largely confined to the valley bottom and would have large areas with water less than 10 feet deep.

Gravel has been taken from a pit near the head of the proposed reservoir, indicating the presence of pervious materials in the vicinity. Impervious borrow materials would need to be brought from several miles away. The silt and alluvium in the valley bottom are not suitable for use as borrow material.

This site is probably not feasible for a reservoir in which a relatively constant water level is desired because of its shallowness and because of the possibility of excessive seepage into the coarse sand and gravel deposits. However, it would be feasible as a basin to catch and retard flood waters.

ELGIN QUADRANGLE

Site 40

Proposed site 40 is largely in the S½ sec. 32, T. 44 N., R. 7 E., about 5 miles north of Huntley, on an intermittent tributary of the Kishwaukee River.

In the area of the site, the silty, sandy, highly variably textured materials of the Gilberts till complex and the fairly uniformly textured, gray, pebbly, silty, clayey Marseilles till are the principal units beneath the thin mantle of loess. The dam would probably be founded on materials of the Gilberts till complex, which would make a satisfactory foundation. Parts of the reservoir would extend into areas underlain by the Marseilles till. Abutment slopes at the damsite are moderately steep; reservoir side slopes vary from moderately steep to gentle. Some small lakes have already been developed in the site area.

Impervious borrow materials can be obtained from deposits of Marseilles till near by. Pervious borrow materials are available a short distance away.

This site is feasible. The materials of both the Gilberts till complex and the Marseilles till are relatively impervious and provide adequate bearing strength. The topography is such that the site could probably be developed to provide a reservoir depth of about 30 feet at the dam.

Site 41

Proposed site 41 is in the NW¼ sec. 3, T. 43 N., R. 7 E., just north of Ballard Road about 5 miles north of Huntley. The reservoir would occupy a swampy area that extends into the SW¼ sec. 34, T. 44 N., R. 7 E.

In the area of the site, deposits of the pink, clayey, silty, sandy Marengo till and the pebbly, clayey, gray Marseilles till are the principal units beneath the thin mantle of loess on the uplands. The surficial deposits in part of the swampy reservoir area consist of alluvial and colluvial deposits of unknown thickness and probably include organic silts, peat, and muck.

The abutment slopes and the slopes of the reservoir sides are gentle. Deposits of the pink, silty, clayey Marengo till probably form the foundation and abutments at the damsite. The gray, clayey Marseilles till probably underlies the part of the reservoir in sec. 34, T. 44 N., R. 7 E. The reservoir could probably be developed to have a depth of about 20 feet at the dam, but large areas would be less than 10 feet deep.

Impervious borrow materials can be obtained from deposits of Marseilles and Marengo till near by. Pervious borrow materials are available in the lowland occupied by the Kishwaukee River. Gravel has been extracted from pits within 3 miles of the damsite. The organic alluvial and colluvial deposits from the swampy areas are not suitable borrow materials.

This site is feasible. The Marengo and Marseilles tills would provide adequate support and are relatively impervious.

Site 42

Proposed site 42 is in the SW¼ sec. 3, T. 43 N., R. 7 E., south of Ballard Road about 4½ miles north of Huntley. The site occupies a shallow, poorly defined valley that drains to the Kishwaukee River.

The damsite and reservoir area are underlain by deposits of the Marengo till complex, which consists largely of the pink, clayey, silty, sandy Marengo till with possible intermixtures of the more sandy materials associated with the Gilberts till complex. Deposits of alluvium containing peat and muck are present in the Kishwaukee River valley only a few hundred feet downstream from the proposed damsite. The abutment slopes and reservoir sides are gentle. Developed to an elevation of 880 feet, the reservoir would be less than 20 feet deep at the dam.

Impervious borrow materials are available near by, and pervious borrow materials can probably be obtained from the valley of the Kishwaukee River.

This site is probably feasible. There is some question of whether the sand and gravel deposits known to occur in the Kishwaukee River valley may be present at this proposed site.

Site 43

Proposed site 43 is located in the SW¼ sec. 30 and the NW¼ sec. 31, T. 43 N., R. 8 E., about 3 miles west of Algonquin. It is situated on the same stream as Lake in the Hills and is about 2 miles upstream from the upper end of that lake. The stream is a tributary of the Fox River.

The damsite and reservoir area are underlain by deposits of the Huntley till complex that are relatively impervious, gray, silty clay till including, perhaps, some deposits of fine sand. Just west of the proposed reservoir area some isolated hills and ridges contain sand and gravel. The gravel content, texture, and thickness of these deposits vary greatly, both horizontally and vertically. The sand and gravel deposits overlie the Huntley till complex. At least one of them has been worked commercially. The abutments and the reservoir sides have moderate slopes, and a reservoir having a depth of about 20 feet at the dam could be developed.

Impervious borrow materials can be obtained near by, and pervious borrow materials may be available from some of the isolated deposits just west of the site. Also, there are large commercial gravel deposits northwest of Algonquin.

This site is feasible. The materials composing the Huntley till complex, which underlies the entire site, are relatively impervious and afford adequate bearing strength. The presence of one or more deposits of fine sand would make seepage a possible problem.

Site 44

Proposed site 44 lies in the SE¼ sec. 29, T. 43 N., R. 8 E., about a quarter of a mile south of Lake in the Hills.

The damsite and reservoir are underlain by deposits of the relatively impervious Marseilles till complex, which consists of the gray, pebbly, silty, clayey Marseilles till intermixed with the gray, silty, clayey Huntley

till and some silt. The pink, clayey, silty, sandy Marengo till underlies these deposits and crops out along the highway north of the site. Deposits of the Marseilles till complex have adequate bearing strength, but if silt deposits are present, they would constitute a potential stability problem that would need to be considered. The abutment slopes and the side slopes of the reservoir are moderately steep. Although the reservoir would not be large, it could be developed to have a depth of about 60 feet at the dam.

Impervious borrow material is available near by, and pervious borrow material can be obtained from the commercial gravel pits northwest of Algonquin.

This site is feasible, and no serious problems are anticipated.

Site 45

Proposed site 45 is in the N½ sec. 33, T. 43 N., R. 8 E., about half a mile west of Algonquin on a tributary of the Fox River.

The stream drains an area underlain by deposits of the Marseilles and Huntley till complexes and by the Marengo till. There are large deposits of West Chicago outwash gravel north and east of the site. A few feet of loess mantles the upland. Deposits of organic, sandy, silty, cobbly alluvium cover the valley bottom.

The stream flows in a shallow channel in a narrow floodplain. The abutment slopes are steep and rise about 80 feet to the upland. The damsite and lower part of the reservoir are underlain by the relatively impervious, pink, clayey, silty, sandy Marengo till. The till has adequate bearing strength and should provide a satisfactory foundation without serious stability or leakage problems.

Reservoir side slopes are moderate to steep. The upper part of the reservoir may be underlain by deposits of the Marseilles and Huntley till complexes, which consist largely of relatively impervious, gray, silty clay till. Topsoil is present on the reservoir sides. No serious problems are anticipated.

Impervious borrow materials are available near by. Pervious borrow materials can be obtained from the extensive gravel deposits northwest of Algonquin.

This site is feasible.

Site 46

Proposed site 46 is in the SW¼ sec. 33, T. 43 N., R. 8 E., just north of Edgewood Road on a small tributary of the Fox River.

The stream drains an area underlain by deposits of the Huntley and Marseilles till complexes and by the Marengo till. North and east of the site, deposits of West Chicago outwash gravel form the surface deposits. A few feet of loess mantles the uplands.

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The abutments and valley sides have moderate to steep slopes, and the valley bottom is narrow. The damsite and lower part of the reservoir are underlain by the relatively impervious, pink, clayey, silty, sandy Marengo till. This till has adequate bearing strength and should provide a satisfactory foundation with no serious leakage or stability problems.

The upper part of the reservoir may be underlain by deposits of the Huntley and Marseilles till complexes, which consist largely of relatively impervious, gray, silty clay till.

Impervious borrow materials can be obtained from the uplands near by, and pervious materials are available from the extensive commercial deposits of gravel near Algonquin.

This site is feasible, and no serious problems are anticipated.

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